City of Greenbelt, Maryland
Memorandum

To: City Council
From: Michael McLaughlin, City Manager MM
Jim Sterling, Acting Director of Public Works
David Moran, Assistant City Manager
Luisa Robles, Sustainability Coordinator
Date: August 5, 2015
Re: Solar Energy Proposal

The Solar Task Force of the City's Green Team has brought forth a proposal to implement solar energy projects on city property/facilities. The purpose of the August 12, 2015 work session is for Steve Skolnik and others from the Task Force to present their work on this issue.

By way of background, the Public Works Department has been involved in discussions/considerations of placing solar panel arrays on City facilities for approximately five years through the Council of Governments (COG). The proposal with Solar City which Mr. Skolnik will reference has been developed by Montgomery County in part as a lead agency for COG. Other firms in the solar business have expressed interest to the City. These firms are Urban Grid and Standard Solar.

The Solar City proposal places solar panel arrays on the roof of the Public Works facility and Green Ridge House and on the ground of the undeveloped Mandan Road right-of-way (ROW) between Greenbriar Phase II and III. The proposal also uses an open area adjacent to the Mandan Road ROW which is Greenbriar property. Mr. Skolnik made a presentation to the Greenbriar Community Association Board on July 22.

The way the proposal works is the City would enter into an agreement with a solar vendor to use/lease property or roof space; the vendor would install, own and maintain the solar array equipment; the power generated by the array would either be used by the facility if the array is on a roof or added back to the "grid;" and the City would buy this electricity from the vendor through a power purchase agreement at a rate that in most cases is lower than the commonly available rate. The vendor makes its money from the revenue for the power and tax credits for the equipment. It is staff's understanding that there are financial breakeven points where this proposal does or does not make financial sense for both the City and any vendor. Use of the full Mandan Road area is important to the finances of the Solar City proposal.

The City of Bowie has recently contracted with Solar City through the Montgomery County agreement for the installation of four (4) MW solar arrays on an old farm owned by Bowie. It is projected the power generated by this array will be equivalent to 60% of the electricity consumed by the City of Bowie. By comparison, the proposed Greenbelt system would be 0.8 MW and generates approximately 30% of the electricity used by the City.

The Public Works Department has a MBO for FY 2016 to explore solar opportunities and the City has committed to a goal of obtaining 20% of its electricity from renewable sources by the year 2022 as part of the Maryland Energy Administration's Smart Energy Communities.

Staff believes there is merit to exploring opportunities for solar energy by the City. It is recommended City Council receive Mr. Skolnik's briefing and indicate if there is interest in pursuing an opportunity for solar. Suggested next steps would include determining Greenbriar's interest at the Mandan Road site, researching other available contracts (e.g. – M-NCPPC) and evaluating proposals of other solar vendors.

Attached to this memo are:

1. Schematics of solar arrays at Mandan, Public Works and Green Ridge House.
2. April 15, 2015 memo from the Solar Task Force.
3. June 17, 2015 memo from Solar Task Force
4. August 6, 2015 memo on City of Bowie experience.

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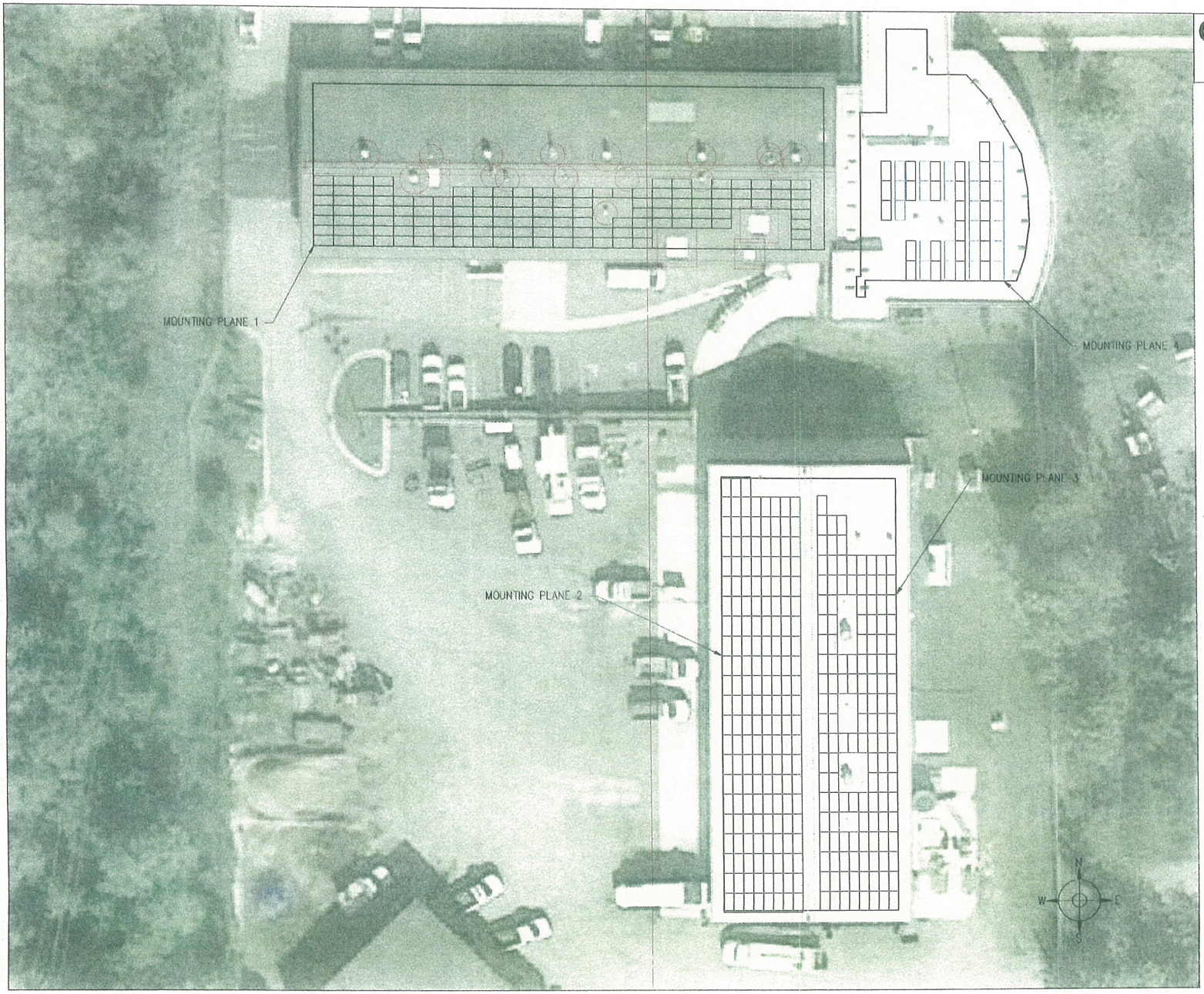
CITY OF GREENBELT

Mandan Road (ground mount)

CITY OF GREENBELT

Public Works Building (roof mount)



CITY OF GREENBELT

Greenridge House (roof mount)

Memo to:	David Moran, Assistant City Manager
Cc:	Mike McLaughlin, City Manager; Jim Sterling, Acting Director Public Works
From:	Solar Task Force, City of Greenbelt Green Team
Date:	April 15, 2015
Re:	Opportunity to develop solar energy for the City of Greenbelt

This memorandum will present and argue for prompt action on an opportunity that is currently available to implement significant solar renewable energy projects at Greenbelt municipal facilities. Both in the Sustainability Plan Framework, and in the City of Greenbelt Policy on Energy Efficiency, a part of the Maryland Smart Energy Communities grant, City Council has expressed a commitment to demonstrate environmental stewardship by promoting development of alternative energy sources and concomitant reduction of the City's dependence on fossil fuels. Specifically, the adopted policy obligates Greenbelt to *"reduce conventional centralized electricity generation serving local government buildings by meeting 20 percent of those buildings' electricity demand with distributed, renewable energy generation by 2022."*

I. Summary of work to date on municipal alternative energy in Greenbelt

The City of Greenbelt has collaborated over the past several years with local and regional governmental bodies and for-profit firms to investigate the feasibility of installing solar energy systems on City buildings:

- Spring 2012 – The Metropolitan Washington Council of Governments (COG), through the EPA Green Power Partnership, funds consulting firm Optony to do an analysis and report on solar feasibility for the City. Optony recommends a 191-kW photovoltaic energy system (PVES) at the Public Works facility, a 77-kW PVES at the Springhill Lake Recreation Center, and a small solar parking shade structure at the Public Works facility. Also mentioned is a possible solar parking shade structure at the parking lot between the Municipal Building and Roosevelt Center.

- Fall 2012 – The City invites Greenbelt Community Solar LLC (GCS), a grass roots organization of local citizens, to make a proposal; GCS declines to offer a project, as the scope envisioned by the City is beyond the legal limitations imposed by the LLC's organizational structure.

- 2013 – COG member Washington Metropolitan Area Transit Authority (WMATA) takes the lead in the Green Power Partnership effort, intending to develop a Power Purchase Agreement (PPA) through the COG/EPA/Optony partnership; however no agreement results over time.

- Spring 2014 – COG member Montgomery County assumes the lead on the COG/EPA/Optony project. This effort splits into two groups within County government: Department of Transportation (DOT) and Department of General Services (DGS).

- Spring 2014 - Montgomery County DOT moves forward with Optony and decides NOT to include riders, due to the unique portfolio of sites. Tyler Espinosa from Optony informs the City of this decision.

- Summer 2014 – The City of Greenbelt meets with Adam Thompson and Wayne Morris of Urban Grid.

- Fall 2014 - Montgomery County Office of Energy and Sustainability, Department of "Green" General Services (DGS) finalizes a PPA with Solar City, and invites Greenbelt to be a rider. Several jurisdictions, including City of Bowie, sign on to this rider agreement.

II. What is a solar photovoltaic energy system (PVES) and how does it work?

A solar PVES is a set of components to collect light energy from the sun, convert it to electricity, and feed that electricity into an electrical distribution system for human use. A typical PVES consists of the following major components:

- Solar array, consisting of a number of solar modules (panels) – mounted on a roof or ground structure and pointed south or west at an angle to face the sun
- Inverter(s) to convert the direct-current (DC) created by the array to alternating current (AC) needed for use in buildings
- Interconnection point from the inverter to the building electrical distribution system (or directly to the utility grid in some cases)
- Bidirectional 'net' meter to accurately measure electric power flow from the solar PVES to the building (or electric grid), and also from the grid into the building
- Wiring and other electrical items to connect above components together for a complete and safe system as required by electrical codes and regulations
- Internet gateway to facilitate remote monitoring and reporting of system operation, electricity production, and fault/abnormal conditions if any

III. How does the Montgomery County / Solar City contract work?

- The Power Purchase Agreement (PPA) recently executed between Montgomery County and Solar City will result in that firm developing a number of solar PVES projects throughout the county.
- Solar City, a nationwide solar developer, organizes and constructs the projects. Through the PPA, Solar City designs, secures permits, constructs, owns and operates the solar systems for the contract duration of (20) years. Solar City arranges with PEPCO to install bidirectional 'net' meters and monitors each solar PVES output. Solar City owns the systems, and is responsible for insurance, performance guarantees, maintenance and repairs, etc.; it retains title to sREC's (solar renewable energy credits), incentives, and tax benefits.
- Montgomery County 'hosts' the solar PVES projects, allowing Solar City access to and use of County facilities for purpose of installing and operating the solar equipment.
- The solar PVES projects are developed by Solar City at zero cost to Montgomery County.
- Solar City sells electricity to Montgomery County. The PPA requires the County to purchase 100% of the solar electricity produced by the systems, at a cost of $.045/kWh (kilowatt-hour), which is substantially lower than that of PEPCO's 'standard offer service'. There is no escalation of this cost over the duration of the contract.

IV. How can Greenbelt develop solar energy using the Montgomery County contract?

- As a participant in the COG program, Greenbelt qualifies to 'piggyback' on the Montgomery County contract, and negotiate directly with Solar City to develop and execute our own PPA.
- Preliminary discussion between a task force member and a Solar City representative is encouraging. Solar City indicates that multiple smaller projects, totaling at least 700kW in solar capacity, are needed in order to render their financing model usable under the PPA structure. Solar City will evaluate sites identified by the City, as to suitability and potential

solar capacity. The per-kWh cost Solar City would be able to offer Greenbelt may depend on the total capacity of solar PVES constructed.

- The Green Team has identified the following municipal facilities that may be suitable for solar PVES installations (this is not an exhaustive list):

Public Works Facility	3 metal roofs, very good for array mounting
Police Station	Roof age: 26 years
Springhill Lake Recreation Center	Roof age: new 2015
Youth Center	Roof age: 35 years (addition roof 24 years)
Municipal Building	Roof age: 25 years (flat roof area 1.5 years)
Greenbelt Theater	Roof age: 25 years
Green Ridge House	Roof age: ??
Aquatic and Fitness Center (flat roof areas)	Roof age: 24 years (flat area)
Community Center (on portions of roof not visible from ground, due to historic landmark restrictions)	Roof age: 20 years
Mandan Rd. green space	Appropriate for ground-mount solar array of approximately 600- to 700-kW

- Buildings with roofs greater than 10 years old should not be considered for a solar array until such time as the roof is replaced.
- The City of Greenbelt pays nothing for installations, only purchasing and paying monthly for the solar electricity actually generated by the solar PVES.
- Once the projects are installed, Solar City continues to own and operate for the duration of the PPA. Solar City is responsible for routine maintenance and repairs; also must purchase and maintain liability insurance to protect City facilities and personnel.
- The PPA may include a 'buy-out' clause, whereby Greenbelt, at sole option, could elect to purchase the project(s) at fair market value at some point in the future.
- In addition to the solar electricity purchased from Solar City, Greenbelt continues to purchase the balance of electricity needed for all facilities from PEPCO or an alternative electricity supplier.
- At the end of the PPA contract period, options are:
    - Solar City must remove solar equipment and restore property to condition prior to installation, at no cost to the City of Greenbelt; OR
    - Greenbelt purchases the solar PVES from Solar City at fair market value; OR
    - Solar City and the City of Greenbelt renew the PPA for an additional term.

V. Advantages to Greenbelt of moving forward now

- Major step towards fulfillment of renewable energy policy
- Zero capital outlay or financing needed
- Significant utility cost savings over time
- Clear demonstration of commitment to environmental stewardship
- Opportunity to 'piggyback' on Montgomery County contract simplifies and expedites the development process

VI. Possible challenges to participation

- City must determine that negotiation with single provider, Solar City, is appropriate and allowed under our procurement rules
- Overall capacity of projects must be at 700kW or greater, according to Solar City representative. There may be difficulty identifying sites capable of supporting projects of sufficient physical size to satisfy this requirement.
- Solar electricity price offered by Solar City may be higher than in Montgomery County PPA, making level of savings lower for Greenbelt

VII. Conclusion

Based on City Council's commitment over the years to promote renewable energy and sustainability, and given the unique opportunity now afforded by the City's qualification to 'piggyback' on a very advantageous Montgomery County contract for major solar project development, the Green Team's solar task force urges the Assistant City Manager and the City Manager to agree that the time to develop solar energy projects in Greenbelt is ripe. We further urge that this conclusion be expressed to the Mayor and the members of City Council, with a recommendation for prompt action to consider a contract between the City of Greenbelt and Solar City, for development of municipal solar energy projects.

Respectfully submitted,
City of Greenbelt, Green Team Solar Task Force

Steve Skolnik Matt Dirksen John Lippert Luisa Robles

Memo to:	Mike McLaughlin, City Manager
Cc:	David Moran, Assistant City Manager, Jim Sterling, Acting Director of Public Works
From:	Solar Task Force, City of Greenbelt Green Team
Date:	June 17, 2015
Re:	Solar City LLC contract offer to develop solar energy for the City of Greenbelt

<TIME SENSITIVE INFORMATION> We are pleased to submit a proposal from Solar City LLC to develop solar energy projects at Greenbelt municipal sites, for consideration and action by City Council. Pursuant to discussions with a Solar City LLC representative, that firm has submitted their proposal to develop solar photovoltaic energy systems (PVES) at three (3) municipal sites here in Greenbelt: Department of Public Works roofs, Mandan Rd. ground-mount array, and Green Ridge House roof.

The Green Team's Solar Task Force and Solar City representative(s), ask to meet with City Council and Managers, to present general and detailed aspects of the proposal, conduct discussion and answer questions, and facilitate prompt acceptance of the proposal and initiation of the project.

Attached you will find the following:

1) Solar City LLC proposal dated 4/28/2015 (98 pages, .pdf format)
2) Solar City LLC proposal revision dated 6/1/2015 (1 page, .doc format)
3) Savings Projection dated 6/2/2015 by Green Team (.xls format)

For background and general information, please refer to the memorandum dated 4/22/2015 by the Green Team, a copy of which is also attached.

The following are germane points of the Solar City proposal and how the City of Greenbelt will benefit:

- Solar electricity produced will offset approximately 31% of municipal consumption, thereby satisfying the City's policy goal for renewable energy.
- Solar electricity output is projected to result in 20-year savings of approximately $1.05 million in electric utility cost to the City.
- Projects will be developed by Solar City at zero capital cost to Greenbelt.
- Solar City LLC and City of Greenbelt will execute a Power Purchase Agreement contract that establishes the 20-year price of solar electricity at each site; Green Team's analysis indicates that selecting the 'zero inflation' option maximizes savings for the City.
- Solar City LLC will retain ownership of solar arrays, maintain and operate them at its sole expense, and sell 100% of the solar power produced to the City.
- At present, average PEPCO electricity price City pays is $0.093/kWh.
- Solar electricity prices for the full contract term will be:
  - $0.065/kWh for Department of Public Works arrays
  - $0.064/kWh for Mandan Rd. ground-mount array
  - $0.069/kWh for Green Ridge House arrays
- Solar City LLC will retain ownership of all incentives, including Investment Tax Credit that is due to expire December, 2016. THIS IS WHY THE PROPOSAL IS TIME SENSITIVE. Solar City has asked for a commitment from the City not later than July, 2015 in order to assure that projects can be designed, permitted, constructed, and accepted for interconnection by PEPCO by this deadline.

We strongly urge prompt action by City Council to consider and accept this proposal.

Respectfully submitted by the City of Greenbelt Green Team Solar Task Force,

CITY OF GREENBELT, MARYLAND

TO: Michael P. McLaughlin MPM
City Manager

FROM: David E. Moran DEM
Assistant City Manager

DATE: August 6, 2015

SUBJ: Bowie's Experience with Solar City Piggyback

As part of the review of the proposed Power Purchase Agreement (PPA) from Solar City, staff contacted Bowie. The City of Bowie is implementing a solar project with Solar City by piggybacking on the Montgomery County Contract and is further along in the process than Greenbelt. I spoke with John Fitzwater, Assistant City Manager to obtain feedback on their experience with Solar City.

Bowie's project consists of two large (13.5 acre) ground mounted solar arrays on City owned property. The area is cleared and used to be farmland. The Bowie project would be 4MW in size. By comparison the proposed Greenbelt project is .8MW.

Below are the three main issues Mr. Fitzwater and I discussed.

PPA Electricity Rates

Under the PPA, a jurisdiction "pays" Solar City for the power being generated from the solar facilities. Montgomery County's rate to purchase the electricity from Solar City is .045/kWh. The rate Bowie will pay is .047/kWh. Bowie explains this is because Solar City will mow the area instead of City staff/contractors. The rates proposed to the City were higher than these two rates .064/kWh for the ground mount array, .065/kWh for the Public Works roof array and .069/kWh for the Green Ridge roof array. Solar City told the Green Team, Greenbelt's rates were higher because we had a relatively small amount of solar facilities being installed as compared to Montgomery County.

Contract Terms

Bowie's initial PPA was the Montgomery Agreement with a number of provisions proposed for deletion. Bowie was able to negotiate and get most of these provisions put back in to their agreement. A similar PPA with deletions was presented to Greenbelt.

Resident Concerns

Bowie held two meetings with interested residents/nearby property owners to discuss this project. The concerns/questions expressed included:

- Size and scope of array.
- Will there be deliveries to and/or will technicians access the site?
- Will the site be mowed and how often?
- Is there a similar solar array nearby we can go visit/see?
- Can there be more trees installed to screen the array from view?

cc: Jim Sterling, Acting Director of Public Works
Richard Fink, Superintendent of Parks
Luisa Robles, Sustainability Coordinator